

ABSTRACT

The invention relates to a method for sensing the range of objects captured by an image or video camera using active illumination from a computer display. This method can be used to aid in vision based segmentation of objects.

In the preferred embodiment of this invention, we compute the difference between two consecutive digital images of a scene captured using a single camera located next to a display, and using the display's brightness as an active source of lighting. For example, the first image could be captured with the display set to a white background, whereas the second image could have the display set to a black background. The display's light reflected back to the camera and, consequently, the two consecutive images' difference, will depend on the intensity of the display illumination, the ambient room light, the reflectivity of objects in the scene, and the distance of these objects from the display and the camera. Assuming that the reflectivity of objects in the scene is approximately constant, the objects which are closer to the display and the camera will reflect larger light differences between the two consecutive images. After thresholding, this difference can be used to segment candidates for the object in the scene closest to the camera. Additional processing is required to eliminate false candidates resulting from differences in object reflectivity or from the motion of objects between the two images.